PBS

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Federal Communications Commission
Office of the Secretary

November 19, 1987

Mr. William J. Tricarico
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, DC 20554

Re: MM Docket No. 87-268

Dear Mr. Tricarico:

I enclose an original and eleven copies of substitute Comments submitted on behalf of the Corporation for Public Broadcasting, the National Association of Public Television Stations, and the Public Broadcasting Service in the above-captioned matter.

As I explained to you, because of a malfunction in our word-processing system, all the footnotes appear at the end of the document we filed yesterday. The enclosed substitute Comments have been reformatted so that the footnotes appear with the associated text. Except for the reformatting, the enclosed Comments are identical to those we filed yesterday, and we request that they be substituted.

If you have any questions, please call me at (703) 739-5063.

I appreciate your assistance in this matter.

Sincerely,

Barbara S. Wellbery
Deputy General Counsel

BSW:mlw
Enclosures

0+11

Public Broadcasting Service
1320 Braddock Place Alexandria, VA 22314-1698 (703)739-5000

In the Matter of	)	
	)	
Advanced Television Systems and Their Impact on the Existing Broadcasting Service	)	MM Docket No. 87-268

COMMENTS

Arthur Pankopf
Susan Dillon
Corporation for Public Broadcasting
1111 - 16th Street, N.W.
Washington, D.C. 20036
(202) 955-5288

Baryn S. Futa
Martha Malkin Zornow
National Association of Public Television Stations
1818 N Street, N.W.
Washington, D.C. 20036
(202) 955-887-1700

Paula A. Jameson
Barbara S. Wellbery
Louise Lynch
Public Broadcasting Service
1320 Braddock Place
Alexandria, VA 22314
(703) 739-5063

DATE: November 18, 1987

COMMENTS OF THE CORPORATION FOR PUBLIC BROADCASTING, THE NATIONAL ASSOCIATION OF PUBLIC TELEVISION STATIONS, AND THE PUBLIC BROADCASTING SERVICE

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COMMENTS OF THE CORPORATION FOR PUBLIC BROADCASTING, THE NATIONAL ASSOCIATION OF PUBLIC TELEVISION STATIONS, AND THE PUBLIC BROADCASTING SERVICE

I. Introduction.

The Corporation for Public Broadcasting ("CPB"), the National Association of Public Television Stations ("NAPTS"), and the Public Broadcasting Service ("PBS"), collectively referred to as "Public Television," hereby file their Comments in response to the Notice of Inquiry in the above-referenced proceeding, FCC MM Docket No. 87-268, FCC 87-246 (August 20, 1987) (the "Notice").

A. Commenting Parties.

CPB is the private, nonprofit corporation authorized by the Public Broadcasting Act of 1967 and financed primarily by federal appropriations to facilitate and promote a nationwide system of public broadcasting. NAPTS and PBS are private, nonprofit membership organizations whose members are licensees of virtually all of the nation's public television stations. NAPTS supports planning, research, and representational activities on behalf of its members. PBS distributes national programming and other program-

related services to the nation's public television stations.

Because the Commission's approach to advanced television technology ("ATV") will affect the long-term viability of terrestrial broadcasting, public television has an important stake in these proceedings.[1] Public television has played and will continue to play a major role in enabling terrestrial broadcasters to offer ATV services.[2] For example, PBS recently provided the first

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[1] The Commission uses the term "ATV" to refer to all proposed advanced television systems that can deliver picture quality better than that of the present NTSC system. Some of these systems appear to provide only a modest improvement. The term "high definition television" or "HDTV" generally refers to a subcategory of ATV systems that deliver picture quality dramatically better than the present NTSC system, usually by providing at least double the number of scanning lines, twice the resolution of detail as compared to NTSC, and a wide aspect ratio display such at 5:3 or 16:9 as compared to 4:3 for NTSC. A generally accepted touchstone for HDTV is whether the image quality is perceived to be equal to that of a high quality 35mm film motion picture theater print.

For the reasons discussed in these Comments, Public Television believes terrestrial broadcasters must be able to transmit an HDTV signal. But consistent with the Commission's usage, these Comments will refer generally to "ATV" systems; where we wish to indicate a certain level of quality, these Comments will refer to "HDTV" systems. This usage is in no way meant to concede that anything less than HDTV will suffice for terrestrial broadcasting.

[2] Public television has long been a pioneer in developing and using new technologies to enhance its programming services. To give just a few examples: Public television established the nation's first satellite program distribution system; developed closed-

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international satellite delivery of an HDTV transmission from Ottawa, Canada to a Congressional Hearing Room in Washington, D.C. PBS also serves as the Secretariat for the Center for Advanced Television Studies, and its staff participates actively on subcommittees of the Advanced Television Systems Committee ("ATSC").[3]

B. Summary of Argument.

In the Notice, the Commission poses many policy and technical questions surrounding the use of ATV by television broadcast licensees. The questions raised include whether and how the FCC should address the problem of enabling terrestrial broadcasters to offer an ATV service that is competitive with the image and sound quality that can be offered by their competitors in the video mass media i.e., cable programmers, direct satellite broadcasters and videocassette distributors.

The Commission should not -- through action or inaction -- foreclose broadcasters from providing such

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captioning for the hearing-impaired; and has been instrumental in the improvement of UHF television transmitter efficiency and receiver performance. Public television's need for ATV capability, and its significant contributions to the development of ATV, are consistent with public television's long history of leadership in the improvement of broadcast television services.

[3] Richard Green (Senior Vice President of PBS Broadcast Operations and Engineering) served as ATSC's first Executive Director, and PBS is conducting propagation tests and measurements for the ATSC.

competitive quality service. If terrestrial broadcasters are not able to offer ATV, it might have the undesirable effect of making terrestrial broadcasting into a second-rate service, which would disadvantage the local-viewing public. Public Television urges the Commission to take an active role in ensuring the selection of a single standard for a terrestrial broadcasting transmission system, either by ratifying a standard selected by the industry or by itself selecting a standard.

The implications of a proposed ATV standard for other policy goals must also be weighed in the balance, of course. These other considerations include the efficiencies that might be made possible by compatibility of that standard with existing receivers and current spectrum allocations; the flexibility with which a new ATV standard could accommodate future enhancements; and the burdens placed on viewers and broadcasters, whether in terms of expenditures or disruption.

Much further research and testing is necessary to determine the precise features of a transmission system and spectrum allocation scheme that will best approach these other goals while meeting the threshold requirement of competitive quality. Any decisions about spectrum allocation must await a far more complete

understanding of the ATV transmission systems in development. In the meanwhile, it is essential to preserve existing spectrum until a reasoned decision can be made. The short-term disadvantages of delaying spectrum decisions are surely outweighed by the possible major long-term disadvantages if terrestrial broadcasting is allowed to wither. The Commission can best aid this process by ensuring that an orderly sequence of required tasks is set and followed.

II. To Remain Viable, Terrestrial Broadcasting, Including Public Television, Must Be Able to Offer ATV of Competitive Quality.

As anyone who has seen an ATV demonstration can attest, ATV technology will tremendously improve the experience of watching television, and will provide picture and sound comparable to that of a first-rate movie theater. Many believe this improvement will truly revolutionize television, as did the change from monochrome to color television. ATV can dramatically enhance broadcast television service in general and public television in particular. If terrestrial broadcasters are unable to provide high definition video service, the viability of terrestrial broadcasting will be jeopardized.

A. Terrestrial Broadcasters' Competitors Will Soon Have ATV Capability.

Terrestrial broadcasting's need for ATV is no longer hypothetical. MUSE receivers and MUSE converters for NTSC receivers are scheduled to be available to American consumers for home video and possible cable and DBS viewing as early as 1990.[4] Once consumers have had an opportunity to view programs in an ATV format in their homes, such quality will soon become the audio-visual standard that viewers demand.

Other video distributors, who are not constrained by the spectrum considerations that currently limit terrestrial broadcasters' ability to offer ATV services, will be able to distribute programs in the advanced format and could easily supplant those distributors that cannot offer ATV. If terrestrial broadcasting, including public television, can only distribute programs with inferior technical quality, it will soon become a second-rate service. This could mean the slow death of free, nearly-universal, locally-differentiated television. Adding an element of urgency is the possibility that once viewers have invested in ATV receivers designed for these other media, a de facto

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[4] Tamotsu Omura and Masau Sugimoto, "Plans for HDTV Development in Japan," paper given at National Association of Broadcasters Engineering Conference, March 29-30, 1987.

standard inhospitable to terrestrial broadcasting may take root.

B. The Terrestrial Broadcasting System Must Be Preserved.

The present terrestrial broadcasting system is the result of fifty years of implementation by the Commission of the goals of the Communications Act of 1934, as amended, 47 U.S.C. Sec. 151 et seq. These goals are that the service be free, universally available,[5] and "locally-differentiated," that is, providing local news, information, and public affairs programming.[6] Other, broader legal obligations to serve

[5] Broadcast television service is now nearly universal. As of March 1986, A.C. Nielsen Company estimated that fewer than two percent of all television households could not receive at least one broadcast television signal over the air. Cable television service to some of these households beyond the reach of broadcast television extends the service of broadcast television stations. Even in the strictly technological sense of "homes passed," however, cable television service is unlikely ever to reach the near-universality that broadcast television has achieved. This is especially unlikely if the rapid penetration of home satellite dishes continues to precede the cabling of rural areas.

[6] Localism has been a critical element of the Commission's broadcast policy since its inception. Section 303(g) of the Communications Act requires the Commission to "generally encourage the larger and more effective use of radio in the public interest." Similarly, Section 307(b) requires the Commission, in its broadcast licensing proceedings, to "make such distribution of licenses, frequencies, hours of operation, and of power among the several States and communities as to provide a fair, efficient and equitable distribution of radio service to each of the same." Before this version of Section 307(b) was

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the "public interest" also attach to a terrestrial broadcasting license. Existing relicensing processes and other procedures ensure that terrestrial broadcasters continue to comply with these goals and obligations. Terrestrial broadcasting is the only communications service capable of meeting all the goals established by the Congress and Commission for a national communications service.[7]

Most importantly, terrestrial broadcasting is valuable to the public for its noncommercial component. Congress enacted the Public Broadcasting Act of 1967 explicitly to ensure a service that "will constitute an expression of diversity and excellence, and which will

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enacted, the law required the Commission to assign channels according to a formula designed to ensure local service. Congress agreed to the flexibility of the present law on the assurance that the Commission would carry out its mandate through a localism policy. Pasadena Broadcasting Co. v. F.C.C., 555 F.2d 1046, 1050 nn.32, 34-35 and accompanying test (D.C. Cir. 1977). The Commission has lived up to this expectation by following a consistent "policy of 'localism' as a sound means of promoting the statutory goal of efficient public service." National Association of Broadcasters v. F.C.C., 740 F.2d 1190, 1198 (D.C. Cir. 1984).

[7] As a practical matter, only over-the-air broadcasters can be expected to serve all these goals. While a direct satellite broadcasting service could conceivably be offered free to viewers, it could not provide local service. Cable, on the other hand, could offer local service, but will never be universal and is not free to viewers. Videocassettes are neither free, local, nor universal.

constitute a source of alternative telecommunications services for all the citizens of the Nation." 47 U.S.C. Sec. 396(a)(5). And the same principles that pertain to commercial broadcasters -- universality, localism, and equitable distribution of service -- also guided Congress and the Commission in establishing the nation's public television system. Congressional and Commission policies have long recognized the important and unique role played by local public television stations in the overall national broadcast scheme and have sought to foster a locally-based nationwide public television system. Sixth Report and Order on Television Assignments, 41 F.C.C. 148, 159 (1952).

Thus, to lose terrestrial broadcasting -- particularly public television -- would deprive local communities throughout the United States of the only system of video program delivery able and legally required to meet their needs, and to meet such needs at no charge. The public would also be deprived of its only source of free noncommercial programming.

The Commission has indicated that if it decides to allocate spectrum capacity for ATV, all currently allocated television channels should be allotted such additional capacity. (Notice, par. 106.) Public Television supports this position as the course most likely to foster a viable ATV terrestrial broadcasting

service and most consistent with well-established congressional and Commission policies.[8]

C. ATV Will Particularly Enhance Public Television Programming.

The advantages of ATV over conventional television are particularly significant for public television programming. Picture clarity indistinguishable from film images, an aspect ratio conforming more closely to the viewer's full field of vision, and virtually undegraded stereo sound are all qualities that will enhance immeasurably the appreciation of cultural, educational, and arts programming, which public television offers far more of than its commercial counterparts. Public television's visually lush costume dramas, concert and opera performances, art and architecture series, science and geography documentaries, and nature and travel programs exemplify the kinds of programming that ATV would greatly enhance. The quality children's and educational programming provided by public television would also be dramatically more effective in an ATV format.

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[8] The Commission has also asked for comment on whether such additional spectrum allotments may be used for purposes other than ATV. (Notice, par. 105.) This question raises extremely complex issues that are premature to address. However, our initial view is that such additional spectrum should be required to be used for ATV. Any other approach would appear to undermine the very rationale for the additional allotment.

III. The Commission Must Play an Active Role in Ensuring that Terrestrial Broadcasters Are Soon Able to Offer ATV of Competitive Quality.

To ensure that terrestrial broadcasting is able to offer viewers TV comparable to that offered by its competitors, the Commission must take certain steps to facilitate the introduction of an ATV broadcast transmission system of competitive quality.

A. The Commission Must Adopt a Single ATV Standard.

The Commission must adopt a single ATV transmission standard for terrestrial broadcasters. Until it has full information on performance criteria and other related issues, the Commission should maintain an open mind about the particular standard to be selected.

Active involvement by the Commission in selecting and implementing a single transmission system standard for ATV is crucial. If the Commission declines to adopt a single ATV terrestrial broadcast transmission system standard, the result may be the emergence of a de facto standard based on short-term lower cost and success in marketing rather than on the nation's long-term communications goals. The ATV transmission systems most successful in achieving market penetration will undoubtedly be those compatible with current NTSC

receivers, although such systems may not necessarily provide the best quality transmission. Once such systems are in use, and their creators and users function as economic lobbies, they will be near impossible to dislodge.

In addition, in allowing multiple standards to develop, the Commission would be abandoning its statutory responsibility to ensure the interoperability of components necessary for a national television system.[9]

A single technical transmission standard would also benefit consumers. An open market approach may require consumer to purchase multiple television receivers, multi-system converters, or expensive "smart" receivers and thus may impose an unnecessary and unfair cost burden on them -- a burden with no offsetting benefit.[10]

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[9] See 47 U.S.C. Sec. 151; see also Technical Regulations, 99 F.C.C. 2d 903 (1984).

The importance of interoperability must not be underestimated. Even if, during the course of deregulation, interoperability is de-emphasized in regard to point-to-point or point-to-multipoint private systems like land mobile, interoperability remains vital to maintaining the reasonable cost of mass distribution systems such as broadcasting.

[10] Basic uniformity and compatibility are the bedrock of television broadcasting in the United States and have been instrumental in making TV available to virtually every American household at a remarkably low price.

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B. The NTSC Standard Should Be Preserved Until an ATV Standard Has Been Selected.

For precisely the same reasons, Public Television urges the Commission to preserve the existing NTSC standard until a single, objectively determined ATV standard can be put in place. Relaxation of the NTSC standard would be the functional equivalent of the Commission's failure to adopt a single transmission standard for terrestrial broadcasting. Further, in abandoning the NTSC standard, the Commission would be abandoning its statutory responsibility to protect against interference and to ensure the interoperability of components necessary for a national television system.[11]

C. The Commission Must Ensure That the ATV Standard Selected Allows Terrestrial Broadcasters to Provide Service of Competitive Quality.

For the reasons discussed in Section II, terrestrial broadcasters must be able to deliver a

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Ubiquity and low prices have been made possible largely by the economies of large scale production and known standards that assure a market for receivers. This result has been achieved without sacrificing competition; the TV receiver industry is highly competitive, with prices much closer to costs than in many other industries. An open market approach would undermine large scale production and a known technical environment, thus disserving the public by imposing higher prices for products of limited usefulness.

[11] See note 9 supra.

signal that is perceived by viewers to be of a quality that is at least as good as the best competing delivery system. The Commission in selecting a standard must ensure that this primary goal is achieved.

D. The Commission Should Also Weigh Other Important Considerations in Selecting an ATV Standard.

With competitive quality as the threshold requirement, there remain several other important factors to be considered in judging all proposed ATV systems. These include, in no particular order: (1) compatibility with existing NTSC receivers; (2) RF spectrum economy, both long-term and during any transition period; (3) compatibility with existing channel allocations; (4) ease or difficulty in making the transition to a new standard; (5) potential of a new ATV standard for accommodating further improvement (i.e., compatibility of probable future enhancements with any new ATV standard); and (6) the costs to be incurred by terrestrial broadcasters and the viewing public.

In this Inquiry, the Commission has sought both technical information about relationships among the ATV system characteristics (including the parameters of possible trade-offs), as well as comments about how various segments of the television industry might, from their separate perspectives, determine optimal choices.

Statements of general preferences, however, are of little value absent a clear understanding of the actual trade-offs involved for important characteristics. Without proven parameters for these theoretical trade-offs, it is too early for the Commission to consider preemptive action on any one of these issues in isolation. These questions cannot be properly evaluated until the many ATV transmission systems currently under development are available for demonstration and testing in hardware.

E. Need for a Plan.

Because of the pressures posed by the upcoming availability of ATV from non-broadcast video media, the Commission must promptly develop a plan of action. It should gather quickly the information necessary for evaluating the various ATV systems and determine a strategy for satisfying the almost certain demands for additional spectrum imposed by transmission systems that enable broadcasters to provide competitive quality ATV services. The Commission's Advisory Committee should work with the ATSC and other industry groups to ensure timely completion of the evaluation of systems and research on spectrum issues crucial to answering the many questions raised by the emergence of ATV. Many industry groups have already begun, or will begin in the near future, to undertake testing and evaluation of

systems and interference criteria. As noted above, Public Television is heavily involved in these efforts.

The Commission should coordinate industry efforts, or itself decide upon and implement, a development schedule that sets a specific and realistic time frame for the various stages necessary for (a) developing competing systems; (b) building test-ready hardware for such systems; (c) conducting performance tests on such systems, including experimental over-the-air transmissions; (d) performing psychophysical tests to determine viewers' ability to discern quality distinctions among systems; (e) determining consumer preference tests on such systems; and (f) ascertaining spectrum use and availability as described in Section IV below.

The Commission has indicated that it plans to act on spectrum questions upon completion of the Interim Report of the Advisory Committee, now scheduled for May 17, 1988. However, the list of tasks and their complexity makes clear that no reasoned decisions can be made on such an accelerated schedule.

As we discuss below, spectrum decisions must follow evaluation of ATV transmission systems. Such evaluation requires, at the very least, testing of actual system hardware and analysis of available spectrum. Endorsement by the Commission of a realistic

plan and schedule will allow the Government and the industry to act concertedly and industriously.

IV. The Commission's Spectrum Allocation Decisions Should Not Foreclose ATV for Terrestrial Broadcasters.

A. The Commission Should Defer any Spectrum Allocation Decisions Until It Has Essential Information on ATV Systems and Spectrum Needs and Availability.

1. ATV and spectrum issues are inseparable from other issues before the Commission in this proceeding. The Notice describes spectrum allocation questions as "[t]he most important the Commission will address in this proceeding, which will unavoidably influence the development and use of advanced television systems." (Notice, par. 41.) The Notice also suggests that the Commission plans to resolve the spectrum capacity issues prior to and separate from the other ATV issues, as it states: "We find it highly desirable to resolve these matters as quickly as possible, and after considering the comments received in response to this inquiry, we intend to resolve the spectrum-related issues in a rule making proceeding expeditiously. [note omitted]" (Notice, par. 41.)

Such precipitous, uninformed resolution of spectrum allocation questions would be unwise. Rather, the selection of a high definition television system and

the development of all necessary information on the full range of spectrum issues raised by this proceeding should precede and shape any spectrum decisions the Commission may make. Failure by the Commission to consider the spectrum needs of the various ATV systems now being developed, as well as the need for interference protection issues and spectrum availability, may unnecessarily foreclose adoption by terrestrial broadcasters of the best ATV system available. There is little doubt that broadcasters will need some amount of additional spectrum to broadcast in a true HDTV format. All the true HDTV transmission systems developed thus far require more spectrum than the standard 6 MHz bandwidth used by the NTSC transmission system.[12] The specific amount of additional spectrum needed is still unclear at this time, however.

Spectrum allocation by the Commission should also turn on the many other related issues that demand extensive study and testing, such as the status of the UHF taboos and other interference protections, the

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[12] Of the ATV systems currently in development, we know of only a few, including the NBC, Del Rey and Hitachi systems, which use only 6 MHz of transmission bandwidth. While none of these have undergone field test evaluations, based on the reports of the proponents, it does not appear likely that these systems will meet the competitive quality test discussed at Section III.C above.

propagation characteristics of various parts of the spectrum, and the actual spectrum available. Data collected with respect to UHF taboos and propagation characteristics are obviously relevant to any inventory of available spectrum; so, too, are the interference characteristics of the various ATV systems developed. Clearly, then, any final inventory of available spectrum must await answers to these questions.

Spectrum decisions, therefore, cannot and must not be segregated from the entire range of issues in question in this proceeding, but rather should properly follow evaluation of ATV systems and spectrum needs and availability. Only when the Commission has complete data before it will it be able to determine the appropriate trade-offs and resolve these issues wisely.[13]

2. Spectrum should be preserved until the Commission can make informed spectrum use decisions. As noted above, little beyond the almost certain need for additional spectrum is now known about the spectrum needs of ATV systems. The Commission accordingly should

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[13] As the Commission itself states, "by maintaining the [spectrum] status quo, we might also be tacitly encouraging the use of an advanced television system that would be the most easily coordinated with the existing allotment scheme, but may not yield quality comparable to other present or future advanced television systems that use greater bandwidths." (Notice, par. 47.)

do all it can to preserve the spectrum available to terrestrial broadcasters for ATV while the necessary information is gathered.

Public Television therefore commends the Commission's decision to defer further sharing of the UHF spectrum at least until the Advisory Committee files an interim report.[14] Public Television further urges the Commission to continue to defer a decision on further sharing until the record on ATV systems, spectrum use, and interference protection is complete.

As the Commission recognizes, the UHF band now seems the most promising area of available spectrum for ATV transmission. At present, the UHF band appears to have the fewest problems in coverage and reception and thus would likely require the least expensive receivers.[15] Accordingly, ensuring the availability of UHF spectrum is of prime importance. Thus, the Commission should continue to preserve all UHF allocations, pending ATV system selection and data

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[14] Order, Gen. Docket No. 85-172, F.C.C. 87-327 (October 21, 1987).

[15] Any technical advantage to using the VHF band is outweighed by the congestion in that band. In addition, as discussed below, because of differing propagation characteristics it may be desirable from a technical viewpoint for any additional spectrum to be allocated for ATV to be contiguous with the already existing spectrum allocation -- and, if not contiguous, as near in the spectrum as possible.

collection regarding available spectrum and the status of interference protections.

The Commission should also preserve the option of using spectrum at 12.2-12.7 GHz, 22 GHz or 23 GHz for ATV. Although little is now known about the practicality of terrestrial television system broadcasting at these frequencies, propagation studies or technical breakthroughs may create the possibility of using these portions of the spectrum for ATV. Moreover, reevaluation of the UHF taboos suggested below may not yield additional UHF spectrum. Again, the Commission should not, by premature action regarding these higher frequencies, bar terrestrial broadcasting from providing ATV. In no event, however, should the Commission disturb existing noncommercial television reservations in the UHF spectrum or allocations in the ITFS band. These allocations are needed for educational purposes and to disturb them would contravene long-standing Commission policy.[16]

B. The Commission Should Oversee Comprehensive Studies on Spectrum Availability.

To determine how much of the UHF band can be made available for ATV, the Commission should ensure that the existing interference protections are evaluated to see

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[16] See, e.g., Instructional Television Fixed Service, 101 F.C.C. 2d 49 (1985).